Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Public Safety and Homeland Security	)	
Bureau Seeks Comment on Increasing	)	
Public Safety Interoperability by	)	PS Docket No. 10-168
Promoting Competition for Public	)	
Safety Communications Technologies	)	
	)	

To: The Commission

REPLY COMMENTS OF HARRIS CORPORATION

This Reply Comment is submitted on behalf of Harris Corporation ("Harris") before the Federal Communications Commission ("Commission") in response to the Commission's Public Notice seeking comment on the potential barriers to achieving nationwide interoperability as a result of marketplace competition for both broadband and narrowband communications.[1] Harris is an international communications and information technology company serving government and commercial markets in more than 150 countries. Harris is a leading technology developer and manufacturer of mission-critical wireless communications for the public safety communications market with more than 500 critical communications systems deployed world-wide. As a pioneer in the development of IP based networks for private radio and broadband applications, Harris supplies industry-leading brands such as VIDA Broadband™, EDACS®, OpenSky®, NetworkFirst™, and Provoice™. In addition, Harris now offers first responders full-spectrum multiband products for joint public safety operations on the local, state, and federal levels: the Harris Unity™ XG-100 and RF-1033M. Harris is also an active member of numerous

[1] Public Safety and Homeland Security Bureau Seeks Comment on Increasing Public Safety Interoperability by Promoting Competition for Public Safety Communications Technologies, *Public Notice*, PS Docket No. 10-168, DA 10-1556 (rel. Aug. 19, 2010) ("Competition Public Notice").

standards and technical committees including the TR-8 Mobile and Personal Private Radio Committee of the Telecommunications Industry Association. Harris has also been an active participant in the P25 standards effort for over 20 years and was instrumental in the development of the ISSI (Inter-RF Sub System Interface) standard.

Harris shares the frustration among public safety practitioners and policymakers that gaps in narrowband communications interoperability still exist nine years after 9/11. While barriers to entry in the public safety marketplace are high and exacerbated by low demand volume, any perceived lack of competition within the public safety narrowband communications market is not the main barrier to solving deficiencies in narrowband communications interoperability. Harris believes that creating true nationwide narrowband interoperability is achievable. The means of providing narrowband interoperability lies in the adoption of Internet Protocol ("IP") technology, implementation of the P25 standards (namely Inter-RF Sub System Interface ("ISSI")), and the alignment of government policies and programs to utilize technology and standards that encourages innovative interoperability solutions and leverages exiting public safety communications investments and infrastructure. Utilizing IP technology and the standards process will not only promote true narrowband interoperability, but also provide for interoperability between narrowband voice networks and broadband data networks.

With regards to broadband interoperability, Harris believes that the industry and government can learn from its past successes and mistakes. For public safety, broadband is truly a Greenfield from the perspective of spectrum and technology, however, the public safety mission is the same and each regional public safety entity has their own unique set of needs and requirements. To establish a nationwide interoperable public safety broadband network (hereinafter "NPSBN"), Harris continues to recommend a network-of-networks national

architecture comprised of multiple core networks to ensure regional, multi-regional and nationwide interoperability.[2] A one technology standard solution using Long Term Evolution ("LTE") across one continuous block of spectrum will go a long way to facilitate broadband interoperability.

I. Competition and Interoperability in the Narrowband Communications Market Are Not Directly Related Concepts.

The Commission should not accept the false premise that more competition in the narrowband public safety marketplace will result in increased narrowband interoperability. As pointed out by the National Public Safety Telecommunications Council ("NPSTC"), "competition and interoperability are completely different factors in the market."[3] NPSTC goes on to note that "the highest level of interoperability is normally achieved when only one provider serve the entire market, as evidenced by the wireless telephone industry prior to the breakup of the Bell system."[4] The San Francisco Bay Area also recognized the distinction between competition and interoperability, noting that interoperability comes from the implementation of standards, not from competition.[5]

The current state of narrowband voice communications has taken shape over several decades. The lack of interoperability has been exacerbated over the years by the failure of government programs to adequately confront the installation and use of proprietary technology

[2] Comments of Harris Corporation, PS Docket No. 06-229, pg. 1 (filed July 19, 2010).

[3] Comments of National Public Safety Telecommunications Council, PS Docket No. 10-168, pg. 4 (filed Sept. 20, 2010).

[4] Id.

[5] Comments of San Francisco Bay Area, PS Docket No. 10-168, pg. 3 (filed Sept. 19, 2010).

and the allocation of disparate blocks of spectrum for public safety use.[6] Such factors have directly driven the deployment of incompatible, non-interoperable radios systems and technology. In particular, Harris agrees with Motorola's evaluation of the impact on interoperability that disparate spectrum allocations have had on the public safety marketplace.[7] While Harris has developed products that support multiple spectrum allocations, such as Harris' Unity Radio, ensuring public safety is provided larger amounts of spectrum to account for future growth in a single spectrum band will make achieving interoperability in the future that much easier. The Commission must ensure that any new spectrum assignments to public safety meet both current and future needs.

Any manufacturer desiring to satisfy market demands may develop wireless communications equipment conforming to varying degrees with the requirements of the voluntary, consensus-based, TIA-102 standard. The adoption of the P25 set of standards was the first attempt to encourage multiple vendors to compete at the radio level within the same band. The P25 Standard was established to allow for competition, particularly for terminal devices on P25 networks, not interoperability. As pointed out by Zetron "Project 25 is the only narrowband public safety communications scheme that can truly promote competition." The website www.project25.org lists nearly 30 suppliers of P25 products and services.

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[6] *See* Statement of Chief Jeffrey Johnson, Before the U.S. House of Representatives Committee on Science and Technology Subcommittee on Technology and Innovation, "Interoperability in Public Safety Communications Equipment" (May 27, 2010).

[7] "In allocating spectrum over the decade, the Commission has tried to address current needs, but has not adequately accounted for future growth and increased requirements for public safety communications. Repeatedly, spectrum decision makers have minimized the amount of spectrum provided. Even with advances in technology, these small slivers of public safety spectrum that exist in different bands have often become saturated and public safety has been forced to request another spectrum allocation. When the Commission has allocated spectrum to public safety, the spectrum was sourced for a different band, establishing the incremental patchwork environment that has caused many of the interoperability problems in today's public safety voice networks. This approach also has driven up network and equipment costs, as public safety has been forced to design networks that are capable of operation over several bands at the same time." Comments of Motorola, Inc., PS Docket No. 10-168, pgs. 16-17 (filed Sept. 20, 2010).

Ultimately, the small market size and extreme operational demands of public safety are the primary barriers to entry in the public safety market.[8] To address the unique needs of public safety, vendors need to provide a wide array of products, from P25 radios and infrastructure to IP networks that connect disparate systems through standardized network architecture. While companies, including Harris, use COTS (commercially available off the shelf) equipment components as part of their system, individual components do not in themselves make a network. A working network is dependent upon network design and the software to manage the network. Therefore, expertise in designing and deploying complex systems and networks is required. If an enterprise has not already invested in the development of communications networks or terminals for other applications, why would they enter a highly demanding market only to capture a fraction of an already small volume of users for terminal sales and an even smaller number of systems? As highlighted by NPSTC, "equipment vendors can choose to dedicate their resources to the specialized and demanding needs to public safety market or apply those resources instead toward a consumer market that is 25 or more times larger."[9]

For decades the public safety marketplace has been dominated by relatively small user groups with basic communications needs, and few very large organizations with highly complex requirements. Vendors were forced to develop equipment that was not compatible with their own equipment due to different operating frequencies and modes. It was not until after 9/11 that federal guidelines, through grant programs such as the Department of Homeland Security's State and Local Homeland Security Grant Program and the National Telecommunications and Information Administration's Public Safety Interoperable Communications Grant program,

[8] *See* Comments of NPSTC, *supra* note 3 (discussing the factors that that affect the state of competition in the public safety market, which includes market size, and specialized and demanding needs of public safety).

[9] Id., at 5-6.

began to encourage multi-jurisdictional and regional system designs. While these and other federal programs are attempting to address the issue of interoperability in new systems, the scope of the effort and size of the problem is too large to be fully addressed in this manner given the amount of existing infrastructure. As Dr. David Boyd, Department of Homeland Security, Science and Technology Directorate, pointed out in his recent testimony in front of the House Science and Technology Subcommittee, "we are dealing with an installed base of close to $100 Billion dollars."[10]

II. Nationwide Interoperability Is Still Achievable For Public Safety Narrowband Communications Through Advances In IP Technology and the Standards Process.

Tragic incidents over the past ten years, such as 9/11 and Hurricane Katrina have highlighted the need for interoperability in Land Mobile Radio Systems and other mission critical communications networks. As an economic matter, the public safety industry has learned it is easier to integrate two systems to create one complete communications solution than it is to eliminate one system in favor of another. Decommissioning an existing system, especially when it is still within its intended lifecycle, requires throwing away valuable assets and obtaining budgeting for new equipment well in advance of previous estimates. Ultimately, the difficulty in providing a definitive solution for a comprehensive narrowband interoperability solution lies in the conflict between a number of operational and economic issues including: (1) utilizing legacy systems still within their intended operational life cycle; (2) reduced state and local government budgets; (3) advances in digital technology; (4) compatibility with existing analog systems; and (5) the adoption of new standards in both narrowband and broadband communications. Even

[10] Statement of Dr. David Boyd, Department of Homeland Security, Science and Technology Directorate, Before the U.S. House of Representatives Committee on Science and Technology Subcommittee on Technology and Innovation, "Interoperability in Public Safety Communications Equipment (May 27, 2010).

taking into account all of these conflicts in the narrowband market, Harris believes that the current sentiment implying that narrowband interoperability is a "lost cause" is inaccurate.

If diverse radio systems can be integrated together, then their strengths are additive. The benefits of a "uniform" narrowband radio system across multiple jurisdictions and agencies is too great to ignore and simply set aside as a "lost cause." An interoperable narrowband solution has obvious benefits, including streamlined communications and enhanced operational capabilities over a multiplicity of technologically dispersed systems—systems that cannot currently interoperate. At the local and state levels, nationwide narrowband interoperability can be achieved by using IP technology to facilitate a "layered systems" approach to interoperability.

A network "layer" consists of a like-frequency (VHF, UHF, or 700/800MHz) and protocol. Under the layered systems approach each network layer would be made uniform. For example, the current VHF frequencies across a state would be gathered and brought all into one system so there could be a VHF trunked layer and also a VHF conventional layer. Under this approach it may not be necessary to add more sites, but rather upgrade the existing sites to P25 to achieve uniformity. Whether new sites need to be built depends on the availability, location, and capacity of current sites—for all layers, combined. When each layer is upgraded to P25 adding an ISSI will allow inter-layer communication, in other words access to multiple band classes (*i.e.,* communications between UHF and VHF frequencies).

While the P25 Phase I Standard did not enable interoperability among disparate frequency bands, even when P25 equipment was deployed, the P25 Phase II Standard, through utilization of the ISSI, will allow disparate systems operating on multiple spectrum bands to be connected. For users that need to routinely operate across all layers, a multi-layer radio that is capable of multi-frequency and multi-protocol operation across all bands will be required—such

as Harris' multi-band Unity Radio.[11] In fact, if an entire narrowband system is devised and designed as an all IP system it will stand ready to interoperate with future broadband systems, which are themselves all IP.[12]

For public safety agencies that have multiple systems (*i.e.,* systems on different frequencies with different protocols) the key piece of the interoperability solution is the ISSI, which has been standardized for P25 Phase II through the TIA-102 Standard. However, many systems today still require custom proprietary solutions to provide inter-network connectivity and do not utilize the TIA-102 ISSI Standard. For a large scale solution, which is both inter-agency and inter-system, a network must host the ISSI. By supporting ISSI connectivity any vendor can provide the requisite interoperability across a range of narrowband public safety communications networks. For example, in Dallas, Texas, through utilization of the ISSI, the Greater Dallas-Fort Worth Area's Motorola narrowband network was able to be connected with Dallas Forth Worth Airport's Harris narrowband network.[13] Harris' has developed its ISSI Gateway product[14] and is confident in the promise the ISSI provides for establishing nationwide narrowband interoperability by utilizing the P25 Standard and the power of IP.

The layered systems approach encourages interoperability while reducing the financial burden on already stretched local public safety communications budgets, minimizing the impact on existing communications while systems are upgraded or built out, and maximizing the

[11] Appendix A includes a data sheet for the Harris Unity Radio. http://www.pspc.harris.com/media/ECR-7679_tcm27-10523.pdf.

[12] "P25 already adopted IP network protocols for non-voice applications, inevitably broadband networks will also. For non-voice applications IP provides the obvious tools to bridge between narrowband P25 networks and broadband public safety networks." Comments of Tait North America, PS Docket 10-168, pg. 4 (filed Sept. 20, 2010).

[13] Appendix B includes Harris Press Release, which can also be viewed at: http://www.pspc.harris.com/news/view_pressrelease.asp?act=lookup&pr_id=3040.

[14] Appendix C includes a data sheet describing Harris ISSI Gateway Product, which can also be viewed at: http://www.pspc.harris.com/NSandM/ISSI.asp.

geographic reach of a network by leveraging existing investments, systems, and infrastructure. Harris firmly believes that nationwide narrowband interoperability is possible by using IP technology and the tools that are already in place, including the most recent set of P25 standards, most significantly the ISSI.

Efforts to encourage narrowband interoperability can be furthered by specific government action that aligns existing government grant programs with the larger vision of upgrading existing systems to accommodate interoperability, such as requiring the inclusion of the ISSI in new systems. The State of Colorado notes the importance of the ISSI, which will help "promote a higher level of interoperability."[15] An alignment between government programs, technology, and standards will encourage interoperability between narrowband networks by incentivizing the completion of the P25 Standard and the adoption of the ISSI. Such government action will not only set the stage for enabling nationwide narrowband interoperability, but also future interoperability between narrowband and broadband networks. Just as the federal government has come together to establish an interoperable, nationwide public safety broadband network (hereinafter "NPSBN"), Harris recommends that a similar collaborative effort be undertaken to promote a nationwide IP solution for narrowband.

III. Nationwide Broadband Interoperability Will Be Best Achieved Through a Network of Networks Nationwide Architecture.

Harris reiterates its support of the Commission's efforts to establish NPSBN based on Long Term Evolution ("LTE") technology. Harris commends the Commission's decision to simultaneously provide public safety access to a critical spectrum resource through the waiver process—the 700 MHz public safety broadband spectrum—while working with public safety and industry partners to establish final rules for an interoperable NPSBN. In order to facilitate

[15] Comments of the State of Colorado, PS Docket No. 10-168, pg. 4 (Sept. 20, 2010).

interoperability among individual broadband networks Harris recommends establishing a network-of-networks nationwide architecture. A network-of-networks nationwide architecture will consist of multiple regional core networks each serving as an aggregation point for smaller networks within its footprint and providing redundancy for adjacent regions.

A network-of-networks nationwide architecture alleviates the need for garnering the economic and operational support required for building out a nationwide, single network solution. Each entity or agency can create its own solution, based on the LTE standard architecture, and in the end connect through its IP broadband network to a regional network core. In fact, by utilizing an IP framework a network-of-networks approach could be expanded beyond broadband networks to also include narrowband networks.[16]

IV. Conclusion

Harris believes that any perceived lack of competition within the public safety narrowband communications market is not the cause of deficiencies in narrowband interoperability. Complete nationwide narrowband interoperability is possible by utilizing IP technology, encouraging the implementation of standards that facilitate interoperability—such as the ISSI—and aligning government priorities with technology and standards. Harris also believes that nationwide broadband interoperability will be most effectively achieved through a network-of-networks approach. Harris looks forward to working with the Commission and industry to provide innovative solutions that enables interoperability across and between all forms of public safety communications.

[16] "The current state of voice interoperability has little bearing on the success of public safety broadband interoperability. However, interoperability requirements applied to the wireless public safety broadband network can be utilized to promote interoperability between the narrowband and broadband networks under certain conditions. With the appropriate framework, there is not technical reason why a network of networks cannot be expanded to include narrowband networks." Comments of Telecommunications Industry Association, PS Docket No. 10-168, pg. 10 (filed September 20, 2010).

Respectfully submitted,

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_____/s/_____

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October 14, 2010

APPENDIX A

Unity™ XG-100P Portable Full-Spectrum Multiband

The Unity XG-100P is the only portable radio that provides

- Full-Spectrum multiband frequency coverage
- Harris' proprietary noise suppression capability
- Built-in GPS and Bluetooth® wireless technology
- Next-generation user interface

The Unity XG-100P Full-Spectrum Multiband Radio's user-centric design delivers unprecedented interoperability, ease of use, and advanced capabilities in a radio that users can depend on for years to come.

Unprecedented Interoperability
The XG-100P covers all portable land mobile radio frequency bands in a *single* radio:

- VHF band (136-174 MHz)
- UHF bands (380-520 MHz)
- 700/800 MHz bands (762-870 MHz)

The XG-100P is a truly interoperable solution, capable of supporting:

- APCO P25 Trunking
- P25 Conventional
- Analog FM Wideband and Narrowband Modes
- MDC-1200 Analog ID

The ability to scan continuously across all bands, voice modes, and encryption types puts unprecedented connectivity in the hands of the user.

Operation in High-Noise Environments
The XG-100P features Harris' proprietary noise suppression capability to provide clear and crisp voice quality in high-noise environments for use in any mode, including both analog and digital communications. The radio is designed with dual microphones and advanced signal processing technology for built-in noise suppression. Additionally, the radio supports accessories such as remote speaker microphones for use with this capability.

GPS-Enabled Situational Awareness
The XG-100P incorporates a Global Positioning System (GPS), enabling user position to be sent securely over the air for personnel position tracking and rapid response for emergencies. This positional information can also be received by other Unity radios and displayed directly on screen for tactical situational awareness of all radio users.

Next-Generation User Interface
The user-centric design of the XG-100P offers significant capability and flexibility beyond push-to-talk:

- Large, full-color display features next-generation graphical user interface (GUI)
- Intuitive use of the radio's features, including GPS, customized scanning, and front panel programming
- Ergonomic design with easy-to-use buttons for hand-held operation
- Large knobs and a configurable top display provide instantaneous radio control when operating in a holster

Bluetooth Wireless Technology
Wireless audio and data accessories for the XG-100P are supported by built-in Bluetooth technology. Additionally, the wireless data interface can be used to connect a computer for programming and configuring radios, with no cable connections required. For security purposes, all connections are initiated and managed from the radio interface and can be secured using AES encryption. Additionally, the Bluetooth transceiver can be disabled, if desired.

Extended Channel Capacity
The XG-100P is designed to maximize interoperability by providing the channel capacity necessary to operate on many systems across all frequency bands:

- Able to store 1,250 channels and 50 system profiles per mission plan
- Able to store up to 10 mission plans for a total of 12,500 channels and 500 system profiles
- Can be completely reconfigured from the front panel by loading different mission plans for different situations

Software-Defined Radio Architecture
Harris has a long history of fielding mission-critical software-defined radios that support evolving customer requirements through software-only upgrades. The XG-100P builds upon this experience and expertise, featuring a true software-defined radio architecture that allows flexibility for future growth, including a software-only upgrade to the APCO P25 Phase 2 standards when available.

SDR forum
2009 Technology of the Year Award Winner

Future-Proof Investment
Every XG-100P is built to exceed the MIL-STD-810F military standards for ruggedness and immersibility. With a 3-year standard radio warranty, the XG-100P Full-Spectrum Multiband Radio is a future-proof investment.

Technical specifications are subject to change without notice. Product sales are subject to applicable U.S. export control laws.

General Specifications

Dimensions (H x W x D):
(Without Knobs and Antenna)
With battery:
6.50 x 2.43 x 1.83 in.
(167.6 x 61.7 x 46.5 mm)

Approximate Weight (with Battery):
22.5 oz (638g)

Input Voltage:
7.5 VDC (nominal)

Immersion:
1 meter for 30 minutes in accordance with MIL-STD-810F

Battery Life (at 5% Tx, 5% Rx, and 90% standby):
Li-Polymer: >12 hours (3600 mAH)

Operating Temperature Range:
-4 to +140°F (-20 to +60°C)

Relative Humidity:
Per MIL-STD-810F

Altitude:
Operational: 15,000 ft (4,572 m)
In Transit: 40,000 ft (12,192 m)

Front Display:
176 pixels x 200 pixels, 2.2 in. transflective LCD, 16-bit color with white LED backlight

Top Display:
128 pixels x 32 pixels, 0.91 in. Organic Light-Emitting Diode (OLED)

Keypad:
Backlight, 2 soft keys, 5-way navigation key, 4x3 keypad, home button

Buttons/Switches:
Large PTT button, on/off knob, volume knob, red emergency button, 16-position top-mounted rotary knob, 2-position concentric switch, 3-position toggle switch, 3 programmable side buttons

TX/RX Indicator:
Multi-color LED

Channel Capacity:
12,500 (1,250 per mission plan)

Options and Accessories

Speaker microphones, programming software and cables, surveillance accessories, antennas, cases, straps, belt loops and swivel mounts, and desk chargers

Intrinsically Safe Options

To be provided upon receipt of Factory Mutual and CSA certifications.

Transmitter

Typical Performance	Full-Spectrum Multiband
Frequency Range (MHz):	136-174 (VHF), 380-520 (UHF), 762-870 (700/800)
Rated RF Power Trunked (W):	VHF: 1-6, UHF: 1-5, 700/800: 0.5-3
Rated RF Power Talkaround (W):	VHF: 1-6, UHF: 1-5, 700/800: 0.5-3
Frequency Stability (-30 to +60°C) (ppm):	±0.5
Modulation Limiting (kHz):	2.5, 4, 5 (FM)
Audio Response (dB):	+1/-3
Spurious and Harmonics (dBc):	-70, FCC Part 90
FM Hum and Noise @ 25 kHz (dB):	VHF: -51, UHF: -54, 700/800: -50
FM Hum and Noise @ 12.5 kHz (dB):	VHF: -45, UHF: -47, 700/800: -44
Audio Distortion (%):	<1.25
P25 Modulation Fidelity (%):	<1.00
P25 Adjacent Channel Power (dBc):	>67
Emission Designators:	16K0F3E, 11K0F3E, 8K4F1E, 8K4F1D, 12K00G1E, 12K00G1D, 14K0F3E

Receiver

Typical Performance	Full-Spectrum Multiband
Frequency Range (MHz):	136-174 (VHF), 380-520 (UHF), 762-870 (700/800)
Channel Spacing (kHz):	12.5, 25
Sensitivity (12 dB SINAD) (dBm):	VHF: -118.5, UHF: -120.3, 700/800: -118.3
P25 Reference Sensitivity (5% BER) (dBm):	VHF: -119.7, UHF: -120.9, 700/800: -119.3
Adjacent Channel Rejection @ 25 kHz (dB):	VHF: 75, UHF: 70, 700/800: 70
P25 Adjacent Channel Rejection @ 12.5 kHz (dB):	VHF: 64.7, UHF: 60, 700/800: 60
Intermodulation (dB):	VHF: 72.5, UHF: 73.6, 700/800: 74
Spurious and Image Rejection (dB):	VHF: 70, UHF: 75, 700/800: 70
FM Hum and Noise @ 25 kHz (dB):	VHF: -53, UHF: -47, 700/800: -47
FM Hum and Noise @ 12.5 kHz (dB):	VHF: -51, UHF: -41, 700/800: -41
Rated/Max. Audio Output (mW):	500/1200
Audio Distortion:	<1.25% @ rated power

Environmental Specifications

Standard	Parameter	Methods & Procedures
MIL-STD-810F*	Low Pressure	500.4/1,2
	High Temperature	501.4/1,2
	Low Temperature	502.4/1,2
	Temperature Shock	503.4/1
	Solar Radiation	505.4/1
	Blowing Rain	506.4/1
	Humidity	507.4
	Salt Fog	509.4
	Blowing Dust & Sand	510.4/1,2
	Immersion	512.4/1
	Vibration (Minimum Integrity)	514.5/1, Category 24
	Vibration (Basic Transportation)	514.5/1, Category 4
	Shock (Functional/Basic)	516.5/1
	Shock (Transit Drop)	516.5/4
	Shock (Bench Handling)	516.5/6

*Also meets equivalent superseded MIL-STD-810C, -D, and -E.

Digital Operation

	APCO P25
Vocoding Method:	Improved MultiBand Excitation (IMBE™)
Data Rate (kbps):	9.6
Modulation:	C4FM
Encryption algorithms:	AES, DES-OFB
Encryption keys:	100, any combination
Encryption keying:	Key loader, P25 OTAR

Regulatory Data

Frequency Range (MHz)	RF Output (W)	Frequency Stability (ppm)	FCC Type Acceptance Number	Applicable FCC Rules	Industry Canada Certification Number	Applicable Industry Canada Rules
136-174	6	0.5	AQZ-XG-100P00	80, 90	122D-XG100P00	RSS-119
380-520	5	0.5	AQZ-XG-100P00	90	122D-XG100P00	RSS-119
763-775, 793-805	2.5	0.5	AQZ-XG-100P00	90	122D-XG100P00	RSS-119
806-824, 851-869	3	0.5	AQZ-XG-100P00	90	122D-XG100P00	RSS-119

Bluetooth®

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APPENDIX B

Harris Corporation Achieves Interoperability Milestone by Unifying Emergency Communications at Dallas/Fort Worth International Airport

Harris P25 ISSI Gateway Passes Rigorous Testing and Certification Process to Provide Regional Interoperability among Airport, Local, Metro, State and Federal First Responders

HOUSTON, TX, August 2, 2010 (APCO International, Booth 231)— Harris Corporation (NYSE:HRS), in cooperation with multiple federal, state and Dallas/Fort Worth (DFW)-area public safety and public service agencies, as well as DFW International Airport and technology providers, participated earlier this month in the successful testing of the nation's first multi-vendor radio communications network using Project 25 (P25) Inter RF Subsystem Interface (ISSI) gateways. The first-of-its-kind public safety communications network will provide regional first responders in the Dallas/Fort Worth area with additional radio coverage and unprecedented interoperability during emergency response situations.

"Never before have federal, state and city agencies coordinated so closely with transportation and private companies to create a public safety communications network," said Steve Shanck, president, Harris Public Safety and Professional Communications. "P25 ISSI standards have long been hailed as the future of interoperable communications. Today public safety communications took a big leap forward with successful testing of multi-vendor P25 systems."

Multiple federal agencies, the cities of Dallas and Fort Worth, The North Central Texas Council of Governments (NCTCOG), Dallas/Fort Worth International Airport, Harris, AT&T, Motorola Corporation, and a group of additional government and private organizations worked together in the construction, deployment and testing of the P25 ISSI gateway. Two of the systems shown to successfully interoperate were Harris' 700MHz P25IP radio system at DFW International Airport with Motorola's P25 enabled radio system located in Cedar Hill, TX.

Project 25 (P25) is the standard for the design and manufacture of interoperable digital two-way wireless communications products. Developed in North America with state, local and federal representatives and Telecommunications Industry Association (TIA) governance, P25 has gained acceptance around the world for public safety, security, public service, and commercial applications. Inter RF Subsystem Interface (ISSI) standard specifies the interface between RF subsystems which will allow them to be connected into wide area networks.

Harris Public Safety and Professional Communications is a leading supplier of *assured communications*® systems and equipment for public safety, federal, utility, commercial and transportation markets — with products ranging from the most advanced IP voice and data networks, to industry leading multiband, multimode radios, to public safety-grade broadband video and data solutions. With more than 80 years of experience, Harris Public Safety and Professional Communications supports over 500 systems around the world.

About Harris Corporation
Harris is an international communications and information technology company serving government and commercial markets in more than 150 countries. Headquartered in Melbourne, Florida, the company has approximately $5 billion of annual revenue and more than 15,000 employees — including nearly 7,000 engineers and scientists. Harris is dedicated to developing best-in-class *assured communications*® products, systems, and services. Additional information about Harris Corporation is available at www.harris.com.

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APPENDIX C

ISSI Gateway

The Inter-RF Subsystem Interface (ISSI) Gateway

- *Provides TIA-standardized network-level communication between P25 radio systems, regardless of system manufacturer*
- *Allows authorized radios to roam between P25 systems*
- *Prevents ID overlaps by assigning temporary unit and group IDs to roaming users*

The Inter-RF Subsystem Interface (ISSI) Gateway provides network-level interoperability between Project 25 Voice, Interoperability, Data, and Access (VIDA) systems and other ISSI-compatible systems. The ISSI Gateway not only allows for inter-system communication but also provides the interface that enables radios to roam between systems.

ISSI Gateway Overview

The ISSI Gateway is based on the Inter-RF Subsystem Interface standard, issued by the Telecommunications Industry Association (TIA) responsible for publishing the Project 25 Land Mobile Radio standards. TIA document TIA-102.BACA defines the interface that provides for interoperability between RF Subsystems (RFSS) regardless of the system manufacturer.

Harris' ISSI Gateway is a software application that resides on standard off-the-shelf hardware and can be added to any VIDA network though a simple Ethernet connection into the IP-based VIDA infrastructure.

Inter-System Communication

In most scenarios, systems which need to interoperate are not managed by a common administrator nor installed at the same time. This means there is no coordination of the system databases and most likely there are overlaps between User and Group IDs. The ISSI Gateway solves this issue. When a group call is made on System 1 and the ISSI passes it to System 2, System 2 can assign a temporary working group identifier used for all subsequent calls made on that group. If desired, the group calls from System 1 can instead be directly affiliated with any existing group within System 2 such that a dispatcher patch is not required to initiate interoperable communications.

Unit Roaming Using ISSI

The ISSI Gateway allows P25 compliant radios to roam between systems, provided they are within the same frequency band and there is some coordination between the system administrators. When a radio from System 1 roams into the coverage area of System 2, the ISSI provides communication of the radio's ability to roam and other user attributes such as user call priority, I-Call capability, etc. System 2 will register the group and unit, assign them temporary IDs and allow the radio to communicate on the system. System 2 passes all of the radio's transmissions back to System 1 via the ISSI Gateway. As mentioned, the roaming user's group calls can be directly affiliated with a permanent group on System 2 if desired.

ISSI Specification Features

The interface of the ISSI provides for the following features:

- Group Calls
- Unit-to-Unit Calls
- Emergency Calls
- Unit and Group Registration when roaming
- Unit and Group IDs sent to home system when roaming

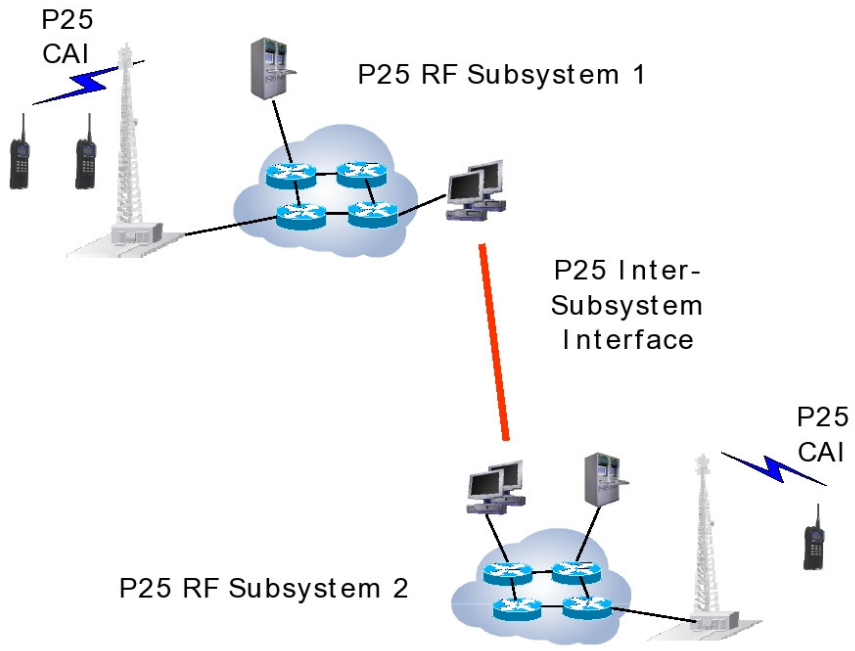
ISSI Gateway

Hardware Components

- Sun Solaris™ 10 Operating System
- 1 Rack Unit 19-inch Chassis
- Quad-Core UltraSPARC® T2 Processor
- 2 146-GB Hard Drives
- 4 GB RAM
- 4 Gigabit Ethernet Ports
- DVD+/-RW Drive
- 3.5-inch Floppy Disk Drive
- 4 USB ports
- Redundant Power Supplies
- RoHS-6 Compliant

Design Features

- Group Calls
- Emergency Calls
- Group and Unit registration
- Supports up to 200 concurrent group calls (Release 2)
- Call Arbitration
- Fault reporting to the Regional Network Manager
- Dynamic Database information from the Unified Administration Server (UAS)
- Provides Call Activity to the Activity Warehouse
- Unit-to-Unit Calls (Release 2)
- Static Configuration via VIDA Device Manager (Release 2)
- Redundant Server Configuration (Release 2)



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